Prelab5

Wednesday, November 11, 2020 3:58 PM

1. $d_1(t) = \sin(2\pi(941)t + \sin(2\pi(1336)t)$

$\omega_0 = 2\pi$ $\sin(1882t) + \sin(2672\pi t)$

$= \frac{1}{2j}(e^{jk\omega_0 t} - e^{-jk\omega_0 t}) + \frac{1}{2j}(e^{j\omega_0 t} - e^{-jk\omega_0 t})$

$= \frac{1}{2j} e^{j941(2\pi)t} - \frac{1}{2j} e^{-j941(2\pi)t} + \frac{1}{2j} e^{j(1336)2\pi t} - \frac{1}{2j} e^{-j(1336)2\pi t}$

$C_{941} = \frac{1}{2j}$ $C_{-941} = \frac{-1}{2j}$ $C_{1336} = \frac{1}{2j}$ $C_{-1336} = \frac{-1}{2j}$

for $941 = k$, $k = 3$ non-zero

b) $\omega = 2\pi f$

so 941 Hz and 1336 Hz

c. $\omega_0 = k\omega_0$

$\omega_1 = 2\pi f = 2\pi 940 = 1882\pi$

$\omega_2 = 2\pi(1336) = 2672\pi$

2. np.array([941, 1336], [697, 1209],
[697, 1336], [697, 1477],
[770, 1209], [770, 1336]
[770, 1477], [852, 1209],
[852, 1209], [852, 1477])